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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,242	12/20/2001	Brian Christian Orr	V201-0077	2148

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EXAMINER

HO, HA DINH

ART UNIT	PAPER NUMBER
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3681

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,242

Applicant(s)

ORR ET AL.

Examiner

Ha D. Ho

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: *Exhibit A*.

DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 10/14/03. Claims 1, 3, 4 and 6 have been amended, and new claims 8-10 have been added accordingly. Claims 1-7 are currently pending.

2. The indicated allowance of claim 6 is withdrawn in view of a newfound reference, JP 61-149,652. Further, claim 6 is rejected as being unpatentable over Applicant Prior Art, Fig. 2, in view of Glaze et al (US 4,733,578).

Election/Restrictions

3. Claim 7 was withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-6 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwata (JP 61-149652).

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Regarding claim 1, Iwata shows a differential casing (see Fig. 2) comprising a chamber (i.e., the chamber of casing 3) having an axle centerline (i.e., axis of shaft 11), a centerpoint (B) (see Exhibit A), and defined by at least one spherical surface (D) and at least one opposing surface (E), wherein a centerpoint (A) of said at least one spherical surface (D) is substantially collinear with said axle centerline and is offset from the centerpoint (B) of the chamber by an offset distance along said axle centerline in a direction away from said opposing surface (E) such that the at least one spherical surface (D) is closer to the centerpoint (A) than the chamber centerpoint (B).

Regarding claim 3, Iwata shows an automotive differential mechanism (see Fig. 2) comprising a first side gear (2d) having a spherical centerpoint (A) (see Exhibit A); a second side gear (2b) having a surface (E); and a differential chamber (i.e., the chamber of casing 3) formed by offsetting the spherical centerpoint (A) of said first side gear (2d) from the chamber centerpoint (B) in a direction away from the surface (E) of said second side gear (2b).

Regarding claim 4, Iwata shows an automotive differential mechanism (see Fig. 2) comprising a pinion shaft (12, 13); first and second pinion gears (2a, 2c); a first side gear (2d) having a first side gear outer radius (R_{11}) (see Exhibit A); a second side gear (2b) having a second side gear outer radius (R_{12}); and a differential casing (3) having an axle centerline (i.e., axis of shaft 11), a casing centerpoint (B), a first axle shaft port (D), a second axle shaft port (E), a first inner radius (i.e., the radius coincides with the radius R_{11} of the side gear 2d), a first radius center point (A), a second inner radius (i.e., the radius coincides with the radius R_{12} of the side gear 2b) and a second radius center point (C), wherein said second radius center point (C) is

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substantially collinear with said axle centerline and offset from said casing centerpoint (B) an offset distance along said axle centerline in a direction away from said first inner radius (R₁₁).

Regarding claim 5, wherein said first and second side gears (2d, 2b) do not have alignment shoulders.

Regarding claim 6, Iwata shows a differential mechanism (see Fig. 2) comprising a casing (3) driven about an axis of rotation (i.e., axis of shaft 11), a pair of pinion gears (2a, 2c) rotatable about an axis of rotation (i.e., axis of shaft 12), a pair of side gears (2d, 2b), means for retaining the side gears from rotating within the chamber about the axis of rotation of the pinion gears including a pair of part-spherical regions (6b, 6d) each providing a recess (F, G) in the chamber for supporting one of the side gears (2b, 2d), each of the part-spherical regions having a center (A, C) located on the axis of rotation of the casing and offset from the intersecting point (B) in a direction opposite the offset of the other.

Regarding claims 8-10, the centerpoint (C) is offset from the chamber centerpoint (B) by an offset distance along the axle centerline in a direction away from the centerpoint (A) (see Exhibit A).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwata (JP 61-149652). Iwata shows the radius (R_{11}) of said at least one spherical surface (D) much larger than the offset distance between the casing centerpoint (B) and the centerpoint (A) of the at least one spherical surface (D). Iwata leaves it up to one having ordinary skill in the art to come up with a ratio of the radius of the at least one spherical surface to the offset distance. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the ratio of the radius of the at least one spherical surface to the offset distance be at 30, since such a selection would have involved a mere change in the size of a component, e.g., how wide in the axial direction the differential chamber is. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

8. Claims 1-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Prior Art, Fig. 2, in view of Glaze et al (US 4,733,578).

Applicant Prior Art, Fig. 2, shows a differential having all the limitations recited in claims 1, 3-6 and 8-10 with the exception that the radius (R) is longer than the distance from the surface (28a) to the casing centerpoint (21) such that the differential chamber is wider in the rotational direction of the pinion shaft (20) than in the rotational direction of the casing (12).

Glaze et al show an embodiment of the differential (see Fig. 2) that has the same feature as of Applicant Prior Art, Fig. 2. Also, Glaze et al show another embodiment (see col. 4, lines 9-11) such that the differential chamber is wider in the rotational direction of the casing (80) than in the rotational direction of the pinion shaft (88) (i.e., making the radius R_1 less than the radius R_2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the differential of Applicant Prior Art, Fig. 2, such that the differential chamber is wider in the rotational direction of the casing than in the rotational direction of the pinion shaft in view of Glaze et al in order to reduce the overall width of the differential (in the rotational direction of the pinion shaft) (note that by making the radius R2 less than the radius R1, the overall axial width is reduced, see col. 3, lines 67-68, therefore, by making the radius R1 less than the radius R2, the overall width in the rotational direction of the pinion shaft is reduced). Note that the modified differential would have all the features as recited in claims 1, 3-6 and 8-10.

Regarding claim 2, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the ratio of the radius of one spherical surface to the offset distance be at 30, since such a selection would have involved a mere change in the size of a component, e.g., how wide in the axial direction the differential chamber is. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

Communication

9. Submission of your response by facsimile transmission is encouraged. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9326 for regular communications and (703) 872-9327 for After Final communications. Recognizing the fact that reducing cycle time in the processing and examination of patent applications will effectively increase a patent's term, it is to your benefit to submit responses by facsimile transmission whenever permissible. Such submission will place the response directly in our examining group's hands and will eliminate Post Office processing and delivery time as well as the PTO's mail room processing and delivery time. For a complete list of correspondence not permitted by facsimile transmission, see M.P.E.P. 502.01. In general, most responses and/or amendments not requiring a fee, as well as those requiring a fee but charging

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such fee to a deposit account, can be submitted by facsimile transmission. Responses requiring a fee which applicant is paying by check should not be submitting by facsimile transmission separately from the check. Responses submitted by facsimile transmission should include a Certificate of Transmission (M.P.E.P.. 512). The following is an example of the format the certification might take:

I hereby certify that this correspondence is being facsimile transmitted to
the Patent and Trademark Office on _____

(Date)

Typed or printed name of person signing this certificate:

(Signature)

If your response is submitted by facsimile transmission, you are hereby reminded that the original should be retained as evidence of authenticity (37 CFR 1.4 and M.P.E.P.. 502.02). Please do not separately mail the original or another copy unless required by the Patent and Trademark Office. Submission of the original response or a follow-up copy of the response after your response has been transmitted by facsimile will only cause further unnecessary delays in the processing of your application; duplicate responses where fees are charged to a deposit account may result in those fees being charged twice.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Examiner Ho whose telephone number is (703) 305-0738. The examiner can normally be reached on Monday-Friday from 7:30 A.M. to 5:00 P.M. Eastern Standard Time. If attempts to reach the examiner by phone are unsuccessful, the examiner's supervisor, Mr. Charles Marmor, can be reached at (703) 308-0830. Any inquiry of a general nature or relating to the status of this application or proceeding should directed to the Group receptionist whose telephone number is (703) 308-2168.

Ha Ho 12/16/03

Ha Ho
Primary Examiner
Art Unit 3681

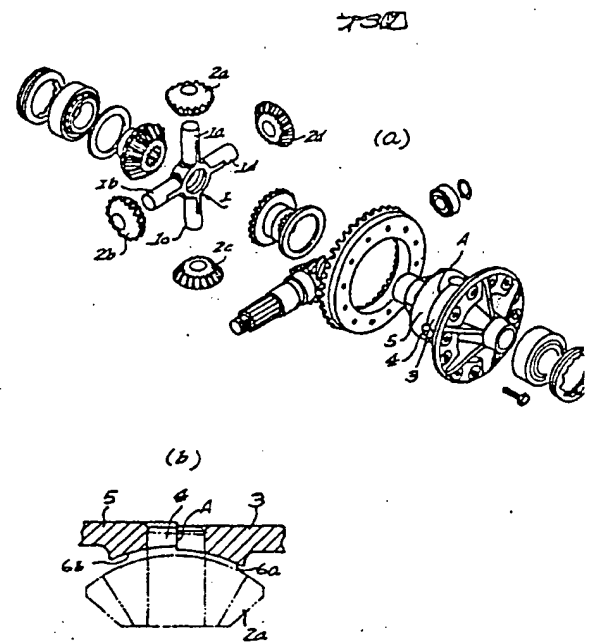
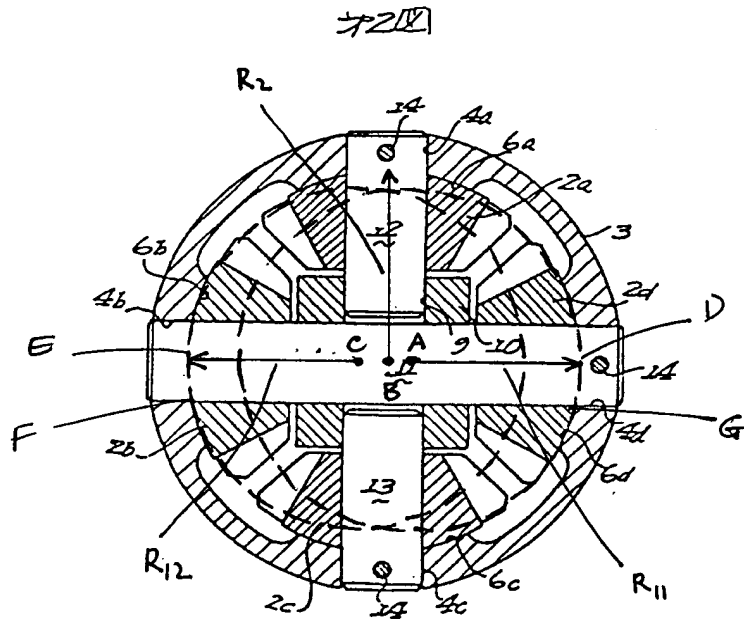


EXHIBIT A